

WHAT IS CLAIMED IS:

1. A sample analysis system with chip-based electrophoresis device, comprising:
an auto-sampling device for loading and introducing a sample;
a chip for loading and separation of the sample;
5 a power supplier for providing electric voltage to said chip and separating said sample;
a detecting unit for detecting the signal generated by said sample;
a signal collecting unit for collecting the signal of the sample detected by the detecting unit; and
a signal processing unit for outputting said signal.
- 10 2. A sample analysis system with chip-based electrophoresis device as claimed in claim 1; wherein said auto-sampling device is a flow-based auto-sampling device by dynamic force.
- 15 3. A sample analysis system with chip-based electrophoresis device as claimed in claim 1; wherein said auto-sampling device further comprising the continuous mode and the discrete mode of sample introduction.
4. A sample analysis system with chip-based electrophoresis device as claimed in claim 3; wherein said discrete mode of sample introduction of the auto-sampling device comprises a pump and an injector.
- 20 5. A sample analysis system with chip-based electrophoresis device as claimed in claim 3; wherein said continuous mode of sample introduction of the auto-sampling device continuously loading sample by means of a microdialysis method.
6. A sample analysis system with chip-based electrophoresis device as claimed in claim 1; wherein said detecting unit is an optical detecting unit.
- 25 7. A sample analysis system with chip-based electrophoresis device as claimed in claim 6; wherein said optical detecting unit is a fluorescent detecting unit which comprises a light source, a lens, an excitation filter, a dichoric mirror, an emission filter, a pinhole, and a photo-multiplier tube.

8. A sample analysis system with chip-based electrophoresis device as claimed in claim 1; wherein said signal processing unit is a computer.

9. A sample analysis system with chip-based electrophoresis device as claimed in claim 1; wherein said signal collecting unit converts the collected signal of the sample from analog signal into digital signal.

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10. A chip-based electrophoresis device for a sample analysis system, comprising: an auto-sampling device for loading and introducing a sample; a chip for loading and separating the sample; and a power supplier for providing electric voltage to said chip for separating said sample.

11. A chip-based electrophoresis device for a sample analysis system as claimed in claim 10, wherein said auto-sampling device is a flow-based auto-sampling device by a dynamic force.

12. A chip-based electrophoresis device for a sample analysis system as claimed in claim 10, wherein said auto-sampling device comprises: the continuous mode and the discrete mode of sample introduction.

13. A chip-based electrophoresis device for a sample analysis system as claimed in claim 12, wherein said discrete mode of sample introduction of the auto-sampling device comprises a pump and an injector.

14. A chip for chip-based electrophoresis device, comprising: a cover plate with a plurality of ports; and a base plate with at least one sample loading channel, at least one separation channel, and at least one connection channel, also the both ends of each of sample loading channel, separation channel, and connection channel has a port corresponding to said cover plate.

15. A chip for chip-based electrophoresis device as claimed in claim 14, wherein said plurality of ports comprising a sample loading port, a waste liquid discharge port, and a plurality of ports for placing electrodes and acting as liquid storage s.

5 16. A chip for chip-based electrophoresis device as claimed in claim 14, wherein
said sample loading channel is for introducing the sample; said separation
channel is for separating the sample; and said connection channel is for
providing a connection channel for the sample during the procedure of
introducing the sample from the sample loading channel into the separation
channel

10 17. A sample analysis system with chip-based electrophoresis device as claimed in
claim 1, wherein said chip can be performed with a derivatization method of a
material surface, comprising the steps of:
1. rinsing the material surface by sodium hydroxide of a certain concentration;
2. rinsing the material surface by evaporated water;
3. rinsing the material surface by acetone, and then place the material surface
at an appropriate temperature for baking and drying;
4. rinsing the material surface by toluene;
5. introducing trimethyldichlorosilane (TMCS) dissolved in toluene with
specific concentration onto the material surface, and continue the reaction for
an appropriate time at a specific temperature;
6. rinsing the material surface by toluene, then fill the material surface with
methanol and let the material surface sit still for an appropriate time;
7. rinsing the material surface by methanol, toluene, and acetone; and
8. baking and dry the material surface at an appropriate temperature.

15 20 18. A sample analysis system with chip-based electrophoresis device as claimed in
claim 17, wherein said derivatization method is used for the material having a
Si-OH material surface.

25 19. A sample analysis system with chip-based electrophoresis device as claimed in
claim 17, wherein said sodium hydroxide concentration as described in step 1
is 1 equivalent weight concentration (N); said appropriate temperature as
described in step 3 is 60°C~80°C; and said specific concentration as described
in step 5 is 10% trimethyldichlorosilane (TMCS) dissolved in toluene

30 20. A sample analysis system with chip-based electrophoresis device as claimed in

claim 17, wherein said trimethyldichlorosilane (TMCS) is replaced by dimethyldichlorosilane (DMCS).

5 21. A sample analysis system with chip-based electrophoresis device as claimed in claim 20, wherein said DMCS has a concentration of 10% DMCS dissolved in toluene.

10 22. A sample analysis system with chip-based electrophoresis device as claimed in claim 17, wherein said specific temperature as described in step 5 is 80°C, and the appropriate time is 60 minutes; said appropriate time as described in step 6 is 5 minutes; and said appropriate temperature as described in step 8 is 60°C ~80°C

15 23. A sample analysis system with chip-based electrophoresis device as claimed in claim 1; wherein said sample loading channel of the chip being applied by electric voltage generates no electrical field.

20 24. A sample analysis system with a chip-based electrophoresis device as claimed in claim 23; wherein said sample loading channel without electric field is able to perform different treatments on its surface for specific bio-reaction of the sample, and then introduce the sample into the separation channel of the chip for immediate online analysis and detection.

25. A sample analysis system with a chip-based electrophoresis device as claimed in claim 24; wherein said surface treatment on the surface of the sample loading channel comprises the immobilized matter of antigen, antibody, protein and enzyme.